

THE NORTHERN HERITAGE SOCIETY:
DEVELOPING INDIGENOUS AND APPROPRIATE SCIENCE
IN THE NORTH

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Yellowknife, N.W.T.

April 1986

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INTRODUCTION AND DESCRIPTION

As this gathering of delegates from universities conducting northern studies indicates, research, and education leading to employment in research activities, is still primarily an activity conducted by professionals based in the South. In contrast, the Northern Heritage Society (based in Yellowknife) is an independent, non-profit organization devoted to conducting research, education and training with and for northerners. The history, growth and activities of the Society (hereafter referred to as the NHS) illustrate some problems and possible solutions for research and science education in the North.

The major objective of the Northern Heritage Society is to preserve and promote cultural and natural heritage through research, education and training. Through its projects, the NHS promotes science education and job training for young northerners. It strives for the mutual education of the people of the north and for scientists, educators and other interest groups, to the advantage of all parties (Cole and Bielawski 1981).

Begun in 1979 by researchers deeply committed to involving northerners in research, to education and training, as well as to conducting research of the highest quality, it is today maintained by a growing staff and alumni participants. It works towards two general goals: heritage resource conservation, and human resource development.

The program began as an archaeological field school. It has since expanded to include ecology and earth science components.

Students (originally 8 per season, now between 10 and 12) attend a brief technical orientation each morning, work all day as field assistants, and attend classes or lab sessions four nights per week. Students are responsible for field notes, readings, lab projects, and keeping a daily journal. The staff, including an archaeologist and two archaeology supervisors, one biologist, a geographer and a cook/coordinator, is responsible for research, monitoring data collection, teaching on-site and in the classroom, and informal counselling and teaching. Scientists and other technical and professional people working in proximity to the field programme are recruited, before and during the field season, to give guest lectures and field sessions to the students. This is a two-way learning experience, for many professionals have never previously worked with northerners.

The curriculum covers standard field and lab methods, arctic prehistory, history, ecology, and physical geography. The field and classroom aspects serve ideally to demonstrate the integration of environmental and cultural developments. Modern northern society is discussed in the context of past and present human adaptations to environment, to other cultural groups, and to change. Most importantly, the students participate directly in research and work closely with scientists as role models.

There is a strong hidden curriculum, based on the premise that a secure sense of one's heritage gives each individual a stronger, more adaptively successful sense of self in today's world (see Cole 1981; also Freeman 1981). Furthermore, students are encouraged to understand science and its role in the changing

north, as they will be the people eventually responsible for evaluating, and living with, the results of research and development. They are the future decision makers of the Arctic. I quote from the Society's 1984 report: "The NHS graduate ought to have confidence in stating that 'science works for everyone'." (Bertulli and Strahlendorf 1984:32).

55 students have participated in the programme. Most are Inuit, and have come primarily from small Arctic communities. Metis, Dene, and Caucasian participants have also come to the program, from communities well within the treeline. Applicants must be residents of the NWT, between 17 and 22 years of age. There is no requirement of current enrollment in school or adult education, but reading and writing English, and basic math skills are required. Upgrading in these basic skills is a process occurring throughout the program. The academic level of the students is rising each year. This is beneficial to the program, which can now incorporate more of the subtle concepts of science into the curriculum. Students are recruited through a comprehensive process including contacts in regional schools, all communities, adult educators, previous project supporters, and general publicity via Anik Info satellite and other media. The programme is now receiving nearly 60 applications for 12 spaces annually.

The project operated from 1979 - 1983 on Somerset Island, and is now established on Devon Island. Research conducted to date includes excavation of a large, complex archaeological site, with survey and excavation at smaller satellite sites, on central



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Somerset Island. Several projects are now in progress on Devon Island. The archaeologists are excavating a site spanning 4000 years of prehistory. The biologists have begun an Arctic haze pollution study with two components. One is water quality sampling of seven lakes in conjunction with the federal Department of Environment, Inland Waters Directorate. The second is study of pollutants carried in Lepidurus arcticus, a freshwater crustacean. Population studies and parasitology of Arctic char are being examined, and the students also participate in descriptive botany, an on-going bird census, and a musk-oxen behavioral study. In 1985 they aided with a study of Inuit folk ornithology. Earth science studies include vegetation cover, soil types, and affects of slope, aspect and moisture at an intensive study site, and examination of macro and micro process of terrain formation at selected locations away from the base camp. One long-term study will be the environmental impact of a scientific field camp used for several years on a unique Arctic location. Meteorology is also taught through daily weather observations, which are broadcast to Resolute Bay and incorporated in a long-term study by the Polar Continental Shelf Project.

The Society has reported much of this research, as well as results of its educational programme in six annual reports, in technical papers, and in articles for the general public (see Bertulli and Strahlendorf 1984, Appendix J). Here, at this Conference, the NMS Newsletter, brochure and papers are available at our poster display, which features photographs of the field

projects. Each year, copies of reports go to all participants and concerned communities. Numerous community consultations have been conducted since the project's inception, and on-site visits are also part of the programme where feasible. Through the recruitment process, the return of participants to home communities, and the aid of local contacts in getting students to and from the field site, many people have become aware of and involved in the annual field operation. Students attending the regional high school in Yellowknife have also participated in the cataloguing of collections for analysis, and received work experience credit.

Unfortunately, financial constraints have limited the pace at which the program has developed and the distribution of research results, as highest priority has been given to continuing the field program, with its direct delivery to students and indirect benefit for their communities.

Broadly-based financial support for the Society has been slowly garnered from private foundations, the private sector, federal job creation and training programs, certain federal departments such as the Polar Continental Shelf Project, without whose logistic support the field costs could not be borne, and various departments of the NWT government. The lack of long-term, dependable support still makes implementing projects difficult.

The Society seeks the highest quality in research, education and training, and a balanced integration of all three. It seeks also to use the knowledge both of northerners and scientists, and to further the preservation of natural and cultural heritage, to

advance science, and the north, through integration and communication of cross-culturally generated knowledge.

INDIGENOUS AND APPROPRIATE SCIENCE FOR THE NORTH

At and since its inception, the NHS strove to address several recurrent problems in northern research and education. Science in the north is inextricably entwined with issues of education, employment and development, for science is now an issue in the politics of self-determination. Over the past decade, the need for the participation of northerners in arctic science has been recognized increasingly (Swinton 1976; Weetaluktuk 1979; Bielawski 1984; United Nations 1985; Inuit Circumpolar Conference 1983:36). Larkin (1978:122 - 123) writes:

"...science must be developed in the north for northerners, and to the maximum extent possible by northerners. First, it is essential that northerners know about their own regions, not only as they do now, but more systematically in the scientific mode. Second, it is essential that northerners have their own scientists to enrich the cultural base of northern communities and to blunt the impact of transients, partly by replacing them, partly by educating them, and partly by dominating them."

There is a passive tone underlying northerners' strong claims for maximum participation in and control over scientific research. Arctic science is expected to continue to be initiated and performed by southern scientists. There is little clear recognition of the possibility that an appropriate arctic science might be initiated and performed by indigenous peoples. Perhaps the implication is that science is perceived as a cultural

activity of southerners, and not that science is an activity all of humanity can engage in. Perhaps there is the feeling that arctic scientific research cannot be done without a Ph.D. and complete assimilation into southern scientific institutions. Perhaps also, there is the belief that scientific research is the handmaiden of economic development projects and so is something suspicious that must be closely watched.

The underlying question might be whether science is so much a part of western cultures that learning science implies the negation of native heritage. We think not. Arctic archaeology is one way of learning about cultural heritage and arctic ecology is one way of learning about natural heritage. Both disciplines are, of course, far more -- they are ways of learning about humanity at large and evolutionary biology in general. Who can have a monopoly on that? When we observe that science is in use all around the world, in many different cultures, are we witnessing a sign of westernization or a sign that science is a culture-free tool to be picked up by anyone?

When discussing science and native culture with northerners one occasionally hears the comment "But the traditional Inuit were scientists". A southern scientist may object -- visions of instruments and libraries of research reports dancing in his or her head. But there is something to such comments in the philosophical sense. Humans are capable of many ways of thinking about the natural world. In a harsh and variable environment, acute observation, hypothesis-testing, close attention to causality and rational thinking get you home safely and feed your

family. Other ways of thinking do not. It is true, of course, that an oral tradition is not conducive to a scientific culture, but then storing and lugging records around were not conducive to a traditional native culture, either.

But times change. Anyone who has moved from tupeks to satellite dishes in one life time knows that. Putting aside all of the above discussion, one comes to the most critical point -- that of self-determination. Whatever else may happen with science in the north in years to come, one may be sure that the principle of self-determination on the part of native peoples will play a critical if not decisive role.

What does self-determination mean in the case of science? Ben Nageak, an Inuit hunter who worked with scientists on the highly successful bowhead whale census conducted by Alaska's North Slope Borough, said "This gives us the ability to manage our own destiny" (MacKenzie 1985). Self-determination in matters of science necessitates an understading of what science can and cannot do. As Hume emphasized (1948:43) knowledge of how the world is doesn't tell you what you ought to do in a moral sense. Science is a tool that provides a certain quality of knowledge about the natural world, but it requires an application of values extraneous to science to decide what to do, or not do, with that knowledge. The application of cultural values of native peoples to scientific knowledge is not only appropriate but necessary. But again, one must have an appreciation of the nature of science to do this effectively. It probably doesn't need to be said that southerners, any more than northerners, are not in general always

exemplary in understanding science or the relationship between science and values.

And what of science education in the north? Is high school science for native northerners, based on a southern Canadian curriculum, appropriate? Is it sufficient? Should there be more emphasis on the solving of practical scientific problems rather than on the imparting of pre-defined chunks of knowledge? What of science education in the field? Northerners have identified the need for alternatives to the formal system of education in the N.W.T. (Kall 1984). Why? Kaulback (1984) has reviewed the literature on styles of learning among native children. The research evidence is persuasive that native students have unusual perceptual strengths that are rarely recognized or accommodated within formal, southern-oriented school curricula. Many educators recognize a mismatch between learning style and instructional methods. Inuit possess highly acute visual skills and image memory. Scientific disciplines lend themselves well to a visual style of instruction.

These observations coupled with native peoples' professed love for and affinity with the land, lead inexorably to the conclusion that a science field school, like that of the NHS, may well be the most effective, appropriate format for science education in the north. This is not to say that formal high school education is to be denigrated, for it is obvious that there are basic language and mathematical skills and some scientific concepts that are better learned in the classroom and

that are necessary and critical prerequisites to a successful science education in the field.

If the claims by native northerners for participation in and control over science are not just an item on a political wish list, but rather, are an early expression of a trend in how science is done in the north -- a trend driven by the principle of self-determination -- then it would be wise to ask ourselves what native people, governments, scientists, and others are doing, and can do, to ensure that change will respect the interests of all concerned. Many scientists do not like the idea of "control" over science or the idea of a science policy. However, the lack of an articulated science policy is a science policy. Scientists traditionally have opposed directed research, with good reason. Directed research is antithetical to the passion and creativity that drive good research. A move towards an appropriate arctic science should not necessitate the concept of directed research. An appropriate arctic science is a science that is conducted in recognition of local culture and interest -- it recognizes that science has meaningful relationships to education, employment and development. If it did not, then there would be no reason why many Canadians care that research is done in this country, that local universities have healthy science departments, that Canada protect its workers' jobs by keeping on the edge of science and technology, and that health, environmental and engineering problems important to Canada receive attention and funding. We want Canadians to become educated in science and obtain employment in science because it

follows naturally (although not always inevitably) that these larger issues we care about will be addressed. Why should it be any different here in the north?

There is a difference between the promotion of an appropriate arctic science and the promotion of interest of southern scientists. Nevertheless, an appropriate arctic science that is healthy and vigorous will be a net positive factor in the work of such scientists. The participation of local, scientifically trained personnel in research projects adds valuable insight. Local people provide a continuity that many southern researchers cannot obtain. A life time of observation, the input of traditional knowledge, an appreciation of local conditions, problems and issues, an experience in different arctic locations and with different research teams are all characteristics local people would possess. Members of different cultural groups are not led by the same physical evidence to the same vision of the natural world. This form of relativity can be very positive and creative. Native people with science training and southern scientists with respect for local culture, working together on a research team, can promote an intellectual volatility in the best sense of the word.

We have used the terms "appropriate" and "indigenous" in reference to arctic science throughout this presentation. The two are almost interchangeable. An appropriate science requires the participation of native people and respect for local culture and interests. An indigenous science suggests that native people engage in science to the point of initiation of research. In

practice, we can anticipate that an appropriate science will merge with an indigenous science. With the driving force of native self-determination and the increasing participation, employment, education and experience in science an emerging indigenous arctic science can be anticipated. If a respect for self-determination necessitates that we consider an indigenous arctic science to be a good thing, then we are obligated to encourage its development, and we anticipate doing so.

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